

THE INVENTION CLAIMED IS

1. In a device for collecting airborne target samples for analysis, the improvement comprising:
a quantity of crushed reactive aerogel adsorbate.
2. The improvement of Claim 1, wherein said aerogel adsorbate includes chemically specific adsorbing chemistries for adsorbing specific target compounds.
3. The improvement of Claim 1, wherein said aerogel adsorbate includes glass fibers.
4. The improvement of Claim 3, wherein said glass fibers are of a 1-0.2 μ m size.
5. The improvement of Claim 1, wherein said aerogel adsorbate is impregnated with a metal.
6. The improvement of Claim 1, wherein said aerogel adsorbate has a surface area ranging from about 300m²/g to about 1100 m²/g.
7. The improvement of Claim 1, wherein said aerogel adsorbate has a density in the range of about 0.003 g/cm³ to about 0.7 g/cm³.
8. The improvement of Claim 1, wherein said aerogel adsorbate is composed of crushed aerogel selected from the group consisting of chemically treated silica aerogels, untreated inorganic aerogels, metal impregnated silica aerogels, metal oxide-silica aerogels, and pure metal oxide aerogels.
9. The improvement of Claim 1, wherein said crushed reactive aerogel adsorbate is contained in an open ended container, whereby airborne target material can flow through the containers for adsorption of target samples by the aerogel adsorbate.
10. The improvement of Claim 10, wherein said open ended container is

constructed and packed with aerogel adsorbate to form a sampler selected from the group consisting of low volume and high volume samplers.

11. A method for environmental and industrial sampling of airborne target material, comprising providing a quantity of an aerogel absorbate, exposing the aerogel absorbate to an airborne material for collecting a sample thereof, removing the collected sample, and analyzing the collected sample.

12. The method of Claim 12, additionally including forming the aerogel absorbate so as to contain chemically specific adsorbing chemistries.

13. The method of Claim 12, additionally including containing the aerogel absorbate in an open ended container prior to exposing the aerogel absorbate to an airborne material.

14. The method of Claim 14, wherein containing the aerogel absorbate is carried out so as to form a low volume or a high volume sampler.

15. The method of Claim 12, wherein removing the collected sample is carried out by heating the aerogel adsorbate to a temperature below the melting point of the aerogel causing the collected sample to be released, and collecting the released sample.

16. The method of Claim 12, wherein removing the collected sample is carried out by dissolving the aerogel adsorbate in a solution, removing the solution, and retaining the collected sample.

17. The method of Claim 17, wherein removing the solution is carried out by a filtering operation.

18. The method of Claim 12, wherein removing the collected sample is carried out by a method selected from the group consisting of thermal release and liquid dissolving/filtering operations.

19. The method of Claim 12, wherein providing the quantity of aerogel

absorbate, is carried out by selecting an aerogel absorbate from the group consisting of aerogels having chemically specific absorbing chemistries, and aerogels treated or impregnated with material for adsorbing specific target compounds.